People's Heartbeats Synchronize When They're Captivated by The Same Story

HUMANS 15 September 2021 By TESSA KOUMOUNDOUROS

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Having evolved with storytelling as a means to pass information across generations, our brains are powerfully attuned to narratives, so much so that we can recall well-told stories better than basic facts.

Stories play a powerful role in shaping the world we've created for ourselves, and it turns out they may even be able to dictate the rhythm of our own heartbeats.

A preliminary study looking at what happens in our bodies as we pay attention to these tales has found our hearts start beating in unison – even if we're miles away from each other.

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"Why does your heart rate go up and down like that?" asks study co-author and biomedical engineer Lucas Parra on Twitter.

"We think it is because you need to be ready to act, at a moment's notice. And for that, you need to know what is going on around you. In other words, you need to be conscious of what is happening. Even if it is just a story."

Paris Brain Institute neuroscientist Pauline Pèrez and colleagues monitored volunteers' heart rates during a series of experiments, using an electrocardiogram.

Listening to a 1-minute snippet of *20,000 Leagues Under the Sea* in one experiment, or a few minutes of instructional videos in another, heart rates were seen to synchronize between stud

The instructional video showed this phenomenon was not tied with emotion, which is something previous studies have theorized after observing this synchrony in people watching the same movie.

But disrupting the volunteers' concentration – by making them count backwards or subjecting them to distracting sounds – diminished their heart's synchronicity, and their ability to recall the narrative.

Memory retention has been shown to align with conscious perception, so this suggests our hearts play a beat in time with our mind's conscious processing of the narrative, the researchers explain.

"What's important is that the listener is paying attention to the actions in the story," says Paris Brain Institute neuroscientist Jacobo Sitt. "It's not about emotions, but about being engaged and attentive, and thinking about what will happen next. Your heart responds to those signals from the brain."

In a final experiment, the researchers even tested this on 19 unconscious patients along with 24 healthy volunteers. As predicted, most of the patients failed to synchronize their heart rates, all except for two. One of these went on to regain full consciousness.

"These results suggest that the patients' [synchronized heartbeats] might carry prognostic information with a specific emphasis on conscious verbal processing," the team writes in their paper.

Aside from changes from physical activity and other stressors, the rhythms of our hearts fluctuate naturally all the time. This has been attributed to autonomic processes – the automatic, unconscious parts of our bodies' regulation, but this study shows conscious processes play a role too.

"There's a lot of literature demonstrating that people synchronize their physiology with each other. But the premise is that somehow you're interacting and physically present in the same place," says Parra.

"What we have found is that the phenomenon is much broader, and that simply following a story and processing stimulus will cause similar fluctuations in people's heart rates. It's the cognitive function that drives your heart rate up or down."

Pèrez and team suspect that individual words (as well as the overall meaning of the narrative and the emotions they inspire) drive the synchronicity, and they note a cohesive narrative is

But they caution that this is a very small study, with each of the experiments consisting of only 20-30 subjects, so the results will need to be verified with larger groups of people. Comparisons with brain scans could possibly help determine if narratives are indeed the cause of the heartbeat synchronicity too.

"Neuroscience is opening up in terms of thinking of the brain as part of an actual anatomical, physical body," says Parra.

"This research is a step in the direction of looking at the brain-body connection more broadly, in terms of how the brain affects the body."

"People think they react to the world in their particular way," adds biomedical engineer Jens Madsen from the City College of New York. "[But] even our hearts react in a very similar way when we listen to short stories. That makes me smile. We're all human."

This research was published in *Cell Reports*.